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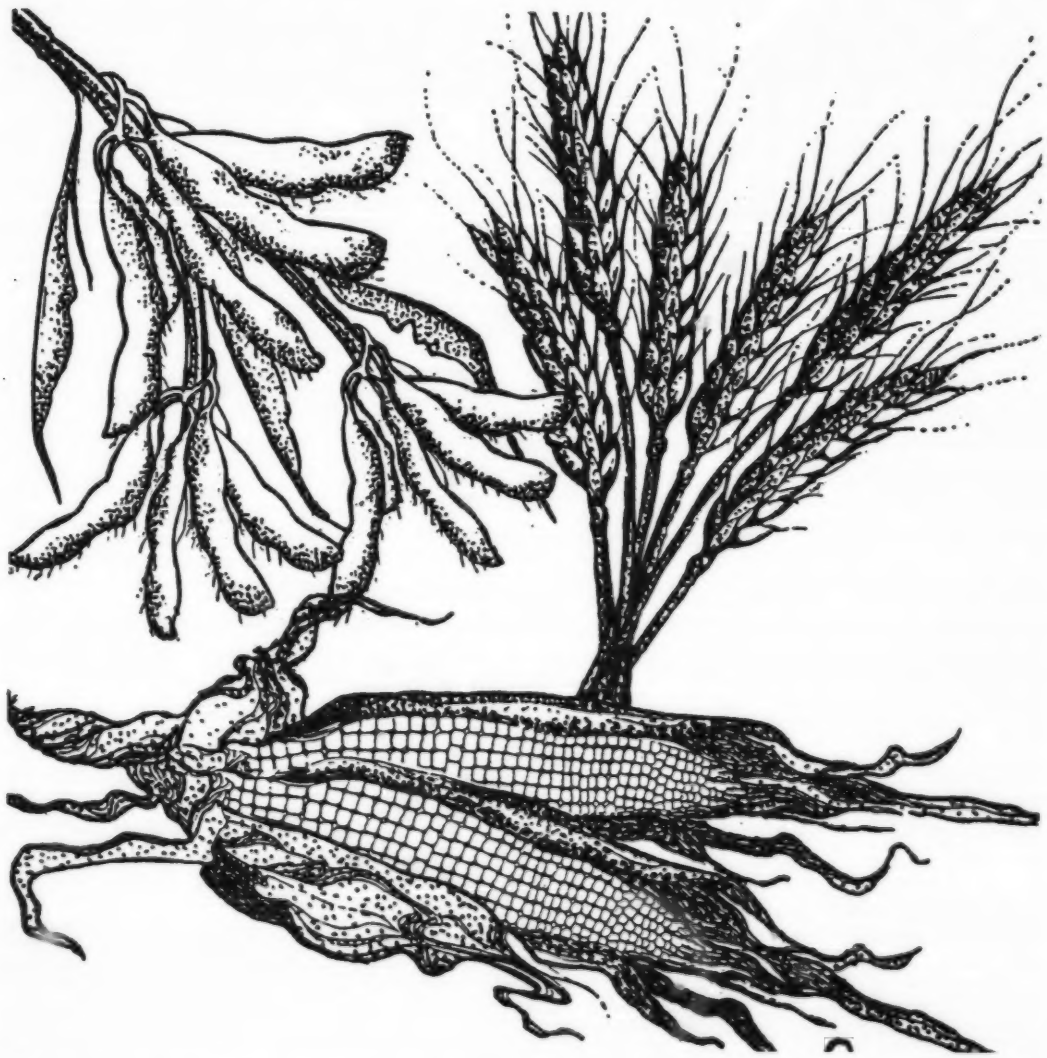
GRAIN AND FORAGE CROPS: ESTIMATED PRODUCTION COSTS ONTARIO, 1988



ECONOMICS AND POLICY
COORDINATION BRANCH

ONTARIO MINISTRY OF AGRICULTURE AND FOOD
LEGISLATIVE BUILDINGS, TORONTO, ONTARIO, M7A 1B6

ECONOMICS INFORMATION

REPORT NO. 88-06

GRAIN AND FORAGE CROPS:

ESTIMATED PRODUCTION COSTS

ONTARIO, 1988

by

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INTRODUCTION

Since 1948, the Economics and Policy Coordination Branch has carried out comprehensive studies of major field and horticultural crops grown in Ontario. These studies were designed to determine costs and returns of various farm enterprises, as well as the physical amounts of production inputs required.

Traditionally, data was collected by means of farmer interviews. Published reports of these studies in the form of county, regional and provincial averages found a wide distribution among extension and research personnel, educational institutions, farm organizations, lending institutions and policy makers. Cooperating farmers received reports showing their individual information in comparison with group averages.

With this extensive background in the development of cost studies, the Economics and Policy Coordination Branch has begun to use computers in the preparation of cost data. Methods of computer simulation have now replaced the time consuming process of data collection, tabulation and analysis.

With this new approach, special attention is paid to the physical quantities and prices of inputs for each crop studied. The technology used in the production of various crops is carefully examined so that the computer models accurately reflect the appropriate production technology for each commodity.

Information on physical inputs is obtained from a number of sources, including:

1. Previous studies done by this Branch;
2. Surveys of the farm supply trade;
3. Technical input/output coefficients; and
4. The consensus of producers, researchers, and extension and agribusiness personnel.

THE DEVELOPMENT OF THE ACRES PROGRAM

A large number of computer programs that generate budgets and crop production cost estimates are now in existence. These computer programs vary in their degree of sophistication and in the amount of detail prepared. A large number of estimates covering a wide range of conditions can be generated quickly and efficiently. The effect of varying levels of technology, management practices and price levels can also be analyzed.

Cost of production estimates used in this report are based on the ACRES program. ACRES (Agricultural Crop Enterprises System) is a FORTRAN program originally written in Montana, adapted by Alberta Agriculture and recently modified and rewritten by the Economics and Policy Coordination Branch to meet Ontario conditions. All 1988 cost of production estimates in this report are based on this computer model.

METHODS AND PROCEDURES

The information used in the preparation of each production cost estimate in this report was prepared through the use of recent Economics and Policy Coordination Branch studies, plus consultations with producers and extension research and agribusiness personnel.

For each crop cost estimate in this report, the data was organized into variable and fixed costs and totalled to arrive at the cost of production both on a per acre and per hectare basis. Variable costs are those which vary directly with the production of each crop grown. They include seed, plants, hired labour, fertilizer, herbicides, insecticides, fungicides, other materials, machinery operating costs, marketing charges and interest on operating capital. Fixed cost inputs are operator labour, management allowance, interest on land, machinery and buildings, depreciation on machinery and buildings, taxes on real estate (net of farm tax rebate), and other overhead cost items.

In this report, cash costs of production are also determined. Cash costs include total variable costs, interest on the debt portion of investment in tractors and machines, taxes and other overhead costs.

LABOUR HOURS AND COSTS

The required number of labour hours was based on previous studies, as well as through discussions with those familiar with the production of each study crop. There are some crops which are harvested on a fixed rate per unit. For these crops, the labour hours and costs vary with the yields used in the cost estimate.

The operator labour hours were valued at $7.40 per hour. In addition, an allowance to management was made at the rate of 5 percent of the gross income.

The hired labour cost was calculated on a per hour basis and included benefits such as worker compensation, unemployment insurance, and the Canada Pension Plan. The rates varied according to area, crop and skill involved.

For some crops, piece work rates were used which were suggested by local farm labour pools. An allowance of 15 percent of basic earnings was added to cover benefits.

MATERIALS

The amount of each material input was based on commonly used practices. Input prices are based on averages charged by the trade in the area where the particular crop is grown. For most crops, the quantities of seed, plants, fertilizer nutrients and other inputs are given on a per hectare basis. Because of the multitude of products available, pesticides are grouped as herbicides, insecticides, fungicides, nematicides, etc. The cost and quantity of non-returnable containers is reported where applicable.

TRACTORS, MACHINES AND TRUCKS

Machinery complements used in the various crop production cost estimates were assumed to be five years old. Tractor and machine costs included depreciation, interest on investment, insurance, storage, repairs, maintenance fuel and lubrication. If machines were used for other farming operations, costs were adjusted based on the proportion of use on the study crop. The declining balance method of depreciation was used, and a 15 percent rate to powered and a 10 percent rate to non-powered machines was applied.

Interest on machinery investment was calculated on the assumption that the equity portion was 70 percent and the debt portion was 30 percent of the total depreciated value. For this report, interest on equity was calculated at 5.0 percent, which was the average interest rate paid by chartered banks on savings accounts. The interest on the debt portion was based on the average prime rate of 10.2 percent, plus one for a total of 11.2 percent. Insurance and storage costs for machinery were based on 1.5 percent of their purchase price.

Repair and maintenance costs for individual machines were based on the fact sheet, "Cost of Owning and Operating Farm Machines", Agdex 825, Ontario Ministry of Agriculture and Food.

Fuel costs were based on the size of each tractor, truck or self-propelled machine used in the production operation. The following farmgate fuel prices were used: gasoline - 29.0 cents/litre; diesel - 30.0 cents/litre. The cost of oil, grease and filters was calculated at 15 percent of the fuel cost.

CUSTOM FARMWORK SERVICES

There are crops produced in Ontario where it is an accepted practice to use custom farmwork services to perform certain operations. Usually, these services are employed when the farmer needs specialized machines, such as harvesters, sprayers, fertilizer applicators and trucks. Most of these machines cannot be economically owned and operated by one producer. Custom costs were itemized on a per hectare or per acre basis.

LAND CHARGES

Determining the annual cost for land use is a controversial part in any study on production costs. During the past two decades, purchasers of farmland have been willing to pay more for it than can be justified from agricultural production. Purchasers believe the speculative aspect of land ownership in inflationary times offers benefits above those received from crop production. In deflationary times, however, this situation is reversed. For this reason, the appropriate interest rate used in calculating the interest cost on bare land for these crop production estimates is the real interest rate. The "real interest rate" is defined as the current lending rate of interest adjusted for inflation.

In this report, interest on land investment was calculated as follows:

1. The value of bare land was based on the average value for land in areas of Ontario where the production of each study crop predominates.

2. The interest rate applied was the average prime rate for 1987 of 9.5 percent discounted for the rate of inflation of 4.4 percent, which resulted in a 5.1 percent rate. It was assumed that land for all study crops would be purchased in the previous year prior to cropping.

No farm real estate taxes were charged to any study crop because of the 1988 Ontario Farm Tax Reduction Program.

BUILDING COSTS

For those crops where buildings are used in grading, packing, and/or storage, a building cost allowance was made.

The initial cost of these structures was based on the assumption that buildings were five years old.

Depreciation	%
Steel and concrete structures	2.5
Wood structures	5.0
Greenhouses	2.0

The interest on building investment was set at 5.1 percent, which was also used in calculating interest on land investment.

Repairs and Maintenance	%
Steel structures	1.0
Concrete structures	0.25
Wood structures	1.5

Insurance

0.5 percent of initial costs

The cost of machine housing was covered under tractor and machine costs.

Allowances are made for the use of picking baskets, storage bins, and other pieces of reusable equipment required in the production of certain crops.

INTEREST ON OPERATING CAPITAL

Interest on operating capital required to finance each crop was calculated from the time an expenditure was made until the time income was generated from sales. Operating capital includes the cost of materials, fuel, repairs, hired labour and other cash items. In this study, the interest rate applied to operating capital was the average estimated prime rate for 1988 of 10.2 percent plus 1 percent for a rate of 11.2 percent.

OTHER OVERHEAD

This allowance covers such items as the study crop's share of utilities, accounting and administration costs, use of the farm automobile, and general farm maintenance.

OTHER COST CONSIDERATIONS

Depending on the crop studied, there are certain additional costs such as crop insurance, marketing board fees, grading charges and selling commissions.

YIELDS AND RETURNS

For each study crop presented in this report, a footnote to the table defines how the average yield and average price were calculated.

Additional information on average yields and prices is shown in the Appendix of this report.

GROSS MARGIN ANALYSIS

Gross margin is the amount above the variable costs that a crop contributes to the operator for his wages, management, and to the investment in machinery and land.

CASH ANALYSIS

The cash analysis section estimates the returns over cash costs. Cash costs comprise of all variable costs, as well as interest on the debt portion of tractor and machine investment, real estate taxes and other overhead costs.

Table 1.--Barley: Estimated Cost of Production, Ontario, 1988

	Cost, Dollars	
	per hectare	per acre
VARIABLE COSTS		
Hired labour, 0.9 hours/ha	5	2
Seed, 111 kg/ha	40	16
Fertilizer, N - 44 kg/ha; P_2O_5 - 44 kg/ha; K_2O - 44 kg/ha	73	30
Herbicide	4	2
Tractor and machine costs:		
Repairs and maintenance	38	15
Fuel	31	12
Crop insurance	10	4
Interest on operating capital	7	3
TOTAL VARIABLE COSTS	208	84
FIXED COSTS		
Operator labour, 3.46 hours/ha	25	10
Management allowance, 5% of gross income	15	6
Tractor and machine costs:		
Depreciation	52	21
Interest on investment	28	11
Insurance and storage	12	5
Interest on land, $1,483/ha @ 5.1% per annum	76	31
Other overhead	37	15
TOTAL FIXED COSTS	245	99
TOTAL ALL COSTS[a]	453	183
COST PER UNIT (Based on average yields of 3.18 tonne/ha and 59 bushels/acre)[b]	142.45/tonne	3.10/bu.
GROSS MARGIN ANALYSIS (Based on average prices of $96.42/tonne and $2.10/bushel)[c]		
Gross income	307	124
Total variable costs	208	84
Gross margin	99	40
CASH ANALYSIS		
Gross income	307	124
Cash costs[d]	257	104
Returns over cash costs	50	20

[a] Storage costs not included, also costs and returns for straw handling not considered.
[b] Five-year average weighted yields for 198[illegible]-87.
[c] Three-year average weighted prices 1985-8[illegible].
[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $12/ha ($5/acre) plus other overhead costs.

Table 2.--Barley: Operation Costs, Ontario, 1988

Operation	Times over	Labour hours per ha	Labour hours per ac.	Labour, tractor and machine costs per ha	Labour, tractor and machine costs per ac
				- dollars -	
Plowing	1	.79	.32	32.99	13.35
Discing	1	.30	.12	15.05	6.09
Spreading fertilizer	1	.49	.20	12.60	5.10
Cultivating & harrowing ..	1	.25	.10	10.21	4.13
Hauling seed	1	.15	.06	4.50	1.82
Planting	1	.59	.24	22.29	9.02
Spraying herbicide	1	.30	.12	8.20	3.32
Combining	1	.74	.30	66.00	26.74
Hauling & unloading at storage	1	.74	.30	19.84	8.03

Table 3.--Grain Corn: Estimated Cost of Production, Ontario, 1988

	Cost, Dollars	
	per hectare	per acre
VARIABLE COSTS		
Hired labour, 1.24 hours/ha	7	3
Seed, 64,250 kg/ha	64	26
Fertilizer, N - 156 kg/ha; P_2O_5 - 55 kg/ha; K_2O - 28 kg/ha	104	42
Herbicide	54	22
Insecticide	29	12
Tractor and machine costs:		
Repairs and maintenance	42	17
Fuel	35	14
Custom drying charges	79	32
Custom storage, 1/2 crop for 5 months	22	9
Custom apply "N"	20	8
Crop insurance	12	5
Marketing fee	2	1
Interest on operating capital	27	11
TOTAL VARIABLE COSTS	497	202
FIXED COSTS		
Operator labour, 3.61 hours/ha	27	11
Management allowance, 5% of gross income	35	14
Tractor and machine costs:		
Depreciation	59	24
Interest on investment	32	13
Insurance and storage	12	5
Interest on land, $2,533/ha @ 5.1% per annum	129	52
Other overhead	37	15
TOTAL FIXED COSTS	331	134
TOTAL ALL COSTS	828	336
COST PER UNIT (Based on average yields of 6.40 tonne/ha and 102 bushels/acre)[a]	129.38/tonne	3.29/bu.
GROSS MARGIN ANALYSIS (Based on average prices of $107.05/tonne and $2.72/bushel)[b]		
Gross income	685	277
Total variable costs	497	202
Gross margin	188	75
CASH ANALYSIS		
Gross income	685	277
Cash costs[c]	550	223
Returns over cash costs	135	54

[a] Five-year average weighted yields for 1983-87.
[b] Projected price includes an estimate of the market price plus the Federal and Net Provincial Stabilization payments.
[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $16/ha ($6/acre) plus other overhead costs.

Table 4.--Grain Corn: Operation Costs, Ontario, 1988

Operation	Times over	Labour hours		Labour, tractor and machine costs	
		per ha	per ac.	per ha	per ac.
				- dollars -	
Plowing, fall	1	.79	.32	32.99	13.35
Discing	1	.30	.12	15.05	6.09
Spreading fertilizer	1	.25	.10	6.30	2.55
Spray herbicide	1	.30	.12	8.20	3.32
Cultivate, harrow and pack	1	.32	.13	12.85	5.20
Hauling seed	1	.12	.05	3.76	1.52
Planting	1	.59	.24	28.34	11.47
Row cultivating	1	.32	.13	8.40	3.40
Custom apply "N"	1	--	--	20.50	8.30
Spray herbicide	1	.30	.12	8.20	3.32
Combining	1	.79	.32	70.50	28.53
Hauling to storage	1	.79	.32	20.46	8.28
Custom drying	1	--	--	78.08	31.60

-- Not applicable.

Table 5.--Oats: Estimated Cost of Production, Ontario, 1988

	Cost, Dollars	
	per hectare	per acre
VARIABLE COSTS		
Hired labour, 0.9 hours/ha	5	2
Seed, certified, 62 kg/ha	27	11
Fertilizer, N - 44 kg/ha; P_2O_5 - 44 kg/ha; K_2O - 44 kg/ha	74	30
Herbicide	5	2
Tractor and machine costs:		
Repairs and maintenance	38	15
Fuel	31	13
Crop insurance	10	4
Interest on operating capital	7	3
TOTAL VARIABLE COSTS	197	80
FIXED COSTS		
Operator labour, 3.46 hours/ha	25	10
Management allowance, 5% of gross income	12	5
Tractor and machine costs:		
Depreciation	52	21
Interest on investment	28	11
Insurance and storage	11	5
Interest on land, $1,483/ha @ 5.1% per annum	76	31
Other overhead	37	15
TOTAL FIXED COSTS	241	98
TOTAL ALL COSTS[a]	438	178
COST PER UNIT (Based on average yields of 2.25 tonne/ha and 59 bushels/acre)[b]	194.67/tonne	3.02/bu.
GROSS MARGIN ANALYSIS (Based on average prices of $108.90/tonne and $1.68/bushel)[c]		
Gross income	245	99
Total variable costs	197	80
Gross margin	48	19
CASH ANALYSIS		
Gross income	245	99
Cash costs[d]	246	100
Returns over cash costs	-1	-1

[a] Storage costs not included, also costs and returns for straw handling not considered.

[b] Five-year average weighted yields for 1983-87.

[c] Three-year average weighted prices 1985-87.

[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $12/ha ($5/acre) plus other overhead costs.

Table 6.--Oats: Operation Costs, Ontario, 1988

Operation	Times over	Labour hours per ha	Labour hours per ac.	Labour, tractor and machine costs per ha	Labour, tractor and machine costs per ac.
				- dollars -	
Plowing	1	.70	.32	32.99	13.35
Discing.....	1	.30	.12	15.05	6.09
Spreading fertilizer	1	.49	.20	12.60	5.10
Cultivating and harrowing.	1	.25	.10	10.21	4.13
Hauling seed	1	.15	.06	4.50	1.82
Planting	1	.59	.24	22.29	9.02
Spraying herbicide	1	.30	.12	8.20	3.32
Combining	1	.74	.30	66.00	26.74
Hauling and unloading at storage	1	.74	.30	19.84	8.03

Table 7.--Soybeans: Estimated Cost of Production, Ontario, 1988

	Cost, dollars	
	per hectare	per acre
VARIABLE COSTS		
Hired labour, 1.60 hours/ha	10	4
Seed, 99 kg/ha	44	18
Fertilizer, N - 15 kg/ha; P_2O_5 - 54 kg/ha; K_2O - 27 kg/ha	52	21
Herbicide	52	21
Seed treatment	10	4
Tractor and machine costs:		
Repairs and maintenance	40	16
Fuel	32	13
Custom storage, 1/2 crop for 5 months	7	3
Crop insurance	14	6
Marketing fees	3	1
Interest on operating capital	12	5
TOTAL VARIABLE COSTS	276	112
FIXED COSTS		
Operator labour, 3.09 hours/ha	23	9
Management allowance, 5% of gross income	35	14
Tractor and machine costs:		
Depreciation	57	23
Interest on investment	32	13
Insurance and storage	12	5
Interest on land, $2,533/ha @ 5.1% per annum	129	52
Other overhead	37	15
TOTAL FIXED COSTS	325	131
TOTAL ALL COSTS	601	243
COST PER UNIT (Based on average yields of 2.42 tonne/ha and 36 bushels/acre)[a]	248.35/tonne	6.75/bu.
GROSS MARGIN ANALYSIS (Based on average prices of $293.86/tonne and $8.00/bushel)[b]		
Gross income	711	288
Total variable costs	276	112
Gross margin	435	176
CASH ANALYSIS		
Gross income	711	288
Cash costs[c]	328	133
Returns over cash costs	383	155

[a] Five-year average weighted yields for 1983-87.
[b] Projected price based on industry estimates including no stabilization payments.
[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $15/ha ($6/acre) plus other overhead costs.

Table 8.--Soybeans: Operation Costs, Ontario, 1988

Operation	Times over	Labour hours per ha	Labour hours per ac.	Labour, tractor and machine costs per ha	Labour, tractor and machine costs per ac.
				- dollars -	
Plowing, fall	1	.72	.29	29.90	12.10
Discing	1	.30	.12	15.05	6.09
Spreading fertilizer	1	.25	.10	6.30	2.55
Spray herbicide	1	.30	.12	8.20	3.32
Incorporate spray	1	.32	.13	13.89	5.62
Hauling seed	1	.12	.05	3.76	1.52
Planting	1	.49	.20	23.60	9.55
Rotary hoeing	1	.27	.11	7.41	3.00
Row cultivating	1	.40	.16	9.88	4.00
Combining	1	.77	.31	68.30	27.64
Hauling to storage	1	.77	.31	19.60	7.93

Table 9.--White Beans: Estimated Cost of Production, Ontario, 1988

	Cost, Dollars	
	per hectare	per acre
VARIABLE COSTS		
Hired labour, 1.3 hours/ha	7	3
Seed, 49 kg/ha	41	17
Fertilizer, N - 28 kg/ha; P_2O_5 - 64 kg/ha; K_2O - 32 kg/ha	67	27
Herbicide	99	40
Fungicide	10	4
Tractor and machine costs:		
Repairs and maintenance	49	20
Fuel	35	14
Custom haul	8	3
Crop insurance	37	15
Marketing fees	8	3
Interest on operating capital	20	8
TOTAL VARIABLE COSTS	381	154
FIXED COSTS		
Operator labour, 7.3 hours/ha	54	22
Management allowance, 5% of gross income	40	16
Tractor and machine costs:		
Depreciation	94	38
Interest on investment	49	20
Insurance and storage	20	8
Interest on land, $2,532/ha @ 5.1% per annum	129	52
Other overhead	37	15
TOTAL FIXED COSTS	423	171
TOTAL ALL COSTS[a]	804	325
COST PER UNIT (Based on average yields of 1.49 tonne/ha and 13.28 cwt/acre)[b]	539.60/tonne	24.47/cwt.
GROSS MARGIN ANALYSIS (Based on average prices of $514.41/tonne and $23.34/cwt.)[c]		
Gross income	766	310
Total variable costs	381	154
Gross margin	385	156
CASH ANALYSIS		
Gross income	766	310
Cash costs[d]	442	179
Returns over cash costs	324	131

[a] Storage costs not included, also costs and returns for straw handling not considered.
[b] Five-year average weighted yields for 1983-87.
[c] Three-year average weighted prices 1985-87.
[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $24/ha ($10/acre) plus other overhead costs.

Table 10.--White Beans: Operation Costs, Ontario, 1988

Operation	Times over	Labour hours per ha	Labour hours per ac.	Labour, tractor and machine costs per ha	Labour, tractor and machine costs per ac.
				- dollars -	
Plowing	1	1.24	.50	41.09	16.63
Field cultivate	3	1.11	.45	37.02	14.98
Spray herbicide (preplant)	1	.49	.20	10.58	4.28
Incorporate spray	1	.37	.15	10.87	4.40
Haul seed and fertilizer	1	.22	.09	4.69	1.90
Planting	1	.74	.30	30.76	12.45
Pick stones	1	1.11	.45	16.53	6.69
Row cultivate	2	1.48	.60	29.73	12.03
Spray herbicide (pre-emerge)	1	.49	.20	10.60	4.29
Pull and windrow	1	.67	.27	54.21	21.94
Combining	1	.67	.27	61.70	24.97
Custom hauling to market	1	--	--	14.43	5.84

-- not applicable.

Table 11.--Winter Wheat: Estimated Cost of Production, Ontario, 1988

	Cost, Dollars	
	per hectare	per acre
VARIABLE COSTS		
Hired labour, .15 hours/ha	1	x
Seed, 141 kg/ha	67	27
Fertilizer, N - 93 kg/ha; P_2O_5 - 55 kg/ha; K_2O - 28 kg/ha	96	39
Herbicide	5	2
Tractor and machine costs:		
Repairs and maintenance	40	16
Fuel	32	13
Custom apply "N"	12	5
Crop insurance	10	4
Marketing board fee	5	2
Interest on operating capital	20	8
TOTAL VARIABLE COSTS	287	116
FIXED COSTS		
Operator labour, 4.57 hours/ha	32	13
Management allowance, 5% of gross income	27	11
Tractor and machine costs:		
Depreciation	57	23
Interest on investment	30	12
Insurance and storage	12	5
Interest on land, $2,533/ha @ 5.1% per annum	129	52
Other overhead	37	15
TOTAL FIXED COSTS	324	131
TOTAL ALL COSTS[a]	611	247
COST PER UNIT (Based on average yields of 3.70 tonne/ha and 55 bushels/acre)[b]	165.14/tonne	4.49/bu.
GROSS MARGIN ANALYSIS (Based on average prices of $146.93/tonne and $4.00/bushel)[c]		
Gross income	544	220
Total variable costs	287	116
Gross margin	257	104
CASH ANALYSIS		
Gross income	544	220
Cash costs[d]	339	137
Returns over cash costs	205	83

x = less than 50 cents per acre.

[a] Storage costs not included, also costs and returns for straw handling not considered.

[b] Five-year average weighted yields for 1983-87.

[c] Projected price includes an estimate of the market price plus the Federal and Net Provincial Stabilization payments.

[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $15/ha ($6/acre) plus other overhead costs.

Table 12.--Winter Wheat: Operation Costs, Ontario, 1988

Operation	Times over	Labour hours		Labour, tractor and machine costs	
		per ha	per ac.	per ha	per ac.
				- dollars -	
Plowing	1	.79	.32	32.99	13.35
Discing	2	.59	.24	30.12	12.19
Spreading fertilizer	1	.25	.10	6.30	2.55
Cultivating, harrowing and packing	1	.30	.12	13.20	5.34
Hauling seed	1	.15	.06	4.50	1.82
Planting in fall	1	.62	.25	23.20	9.39
Applying "N" in spring (Custom)	1	--	--	12.35	5.00
Spraying herbicide	1	.30	.12	8.20	3.32
Combining	1	.74	.30	66.08	26.74
Hauling to elevator	1	.74	.30	20.14	8.15

-- Not applicable.

Table 13.--Kidney and Cranberry Beans: Estimated Cost of Production, Ontario, 1988

	Cost, Dollars per hectare	Cost, Dollars per acre
VARIABLE COSTS		
Hired labour, 1.3 hours/ha	7	3
Seed, 85 kg/ha	106	43
Fertilizer, N - 58 kg/ha; P_2O_5 - 48 kg/ha; K_2O - 24 kg/ha	74	30
Herbicide	60	24
Tractor and machine costs:		
Repairs and maintenance	49	20
Fuel	35	14
Custom haul	10	4
Crop insurance	42	17
Interest on operating capital	22	9
TOTAL VARIABLE COSTS	405	164
FIXED COSTS		
Operator labour, 7.3 hours/ha	54	22
Management allowance, 5% of gross income	52	21
Tractor and machine costs:		
Depreciation	94	38
Interest on investment	49	20
Insurance and storage	20	8
Interest on land, $2,532/ha @ 5.1 per annum	128	52
Other overhead	37	15
TOTAL FIXED COSTS	434	176
TOTAL ALL COSTS[a]	839	340
COST PER UNIT (Based on average yields of 1.72 tonne/ha and 15.35 cwt./acre)[b]	487.79/tonne	22.15/cwt.
GROSS MARGIN ANALYSIS (Based on average prices of $590.67/tonne and $26.80/cwt.)[c]		
Gross income	1,016	411
Total variable costs	405	164
Gross margin	611	247
CASH ANALYSIS		
Gross income	1,016	411
Cash costs[d]	466	189
Returns over cash costs	550	222

[a] Storage costs not included, also costs and returns for straw handling not considered.

[b] Five-year average weighted yields for 1983-87.

[c] Three-year average weighted prices 1985-87.

[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $24/ha ($10/acre) plus other overhead costs.

Table 14.--Kidney and Cranberry Beans: Operation Costs, Ontario, 1988

Operation	Times over	Labour hours per ha.	Labour hours per ac.	Labour, tractor and machine costs per ha.	Labour, tractor and machine costs per ac.
				- dollars -	
Plowing	1	1.24	.50	41.09	16.63
Field cultivate	3	1.11	.45	37.02	14.98
Spray herbicide (preplant)	1	.49	.20	10.58	4.28
Incorporate spray	1	.37	.15	10.87	4.40
Haul seed and fertilizer	1	.22	.09	4.67	1.89
Planting	1	.74	.30	30.76	12.45
Pick stones	1	1.11	.45	16.36	6.62
Row cultivate	2	1.48	.60	29.73	12.03
Spray herbicide (pre-emerge)	1	.49	.20	10.58	4.28
Pull and windrow	1	.69	.28	54.21	21.94
Combining	1	.69	.28	61.70	24.97
Custom hauling to market	1	--	--	9.39	3.80

-- Not applicable.

Table 15.--Alfalfa Hay: Estimated Cost of Production, Ontario, 1988

	Cost, Dollars	
	per hectare	per acre
VARIABLE COSTS		
Establishment costs:		
Alfalfa seed, 11.1 kg/ha	79	32
Timothy seed, 2.5 kg/ha	7	3
Fertilizer; P_2O_5 - 33 kg/ha; K_2O - 100 kg/ha (applied)	66	27
Herbicide	18	7
Crop insurance	7	3
Total establishment costs	177	72
Annual cost (establishment costs spread over 3 years of production)	59	24
Hired labour, 6.0 hours/ha	32	13
Fertilizer, P_2O_5 - 37 kg/ha; K_2O - 111 kg/ha (fall applied)	59	24
Twine	24	10
Tractor and machine costs:		
Repairs and maintenance	30	12
Fuel	20	8
Crop insurance	17	7
Interest on operating capital	13	5
TOTAL VARIABLE COSTS	254	103
FIXED COSTS		
Operator labour, 5.26 hours/ha	40	16
Management allowance, 5% of gross income	32	13
Tractor and machine costs:		
Depreciation	106	43
Interest on investment	57	23
Insurance and storage	22	9
Interest on land, $2,100/ha @ 5.1% per annum	107	43
Other overhead	25	10
TOTAL FIXED COSTS	389	157
TOTAL ALL COSTS[a]	643	260
COST PER UNIT (Based on average yields of 9.0 tonne/ha and 4.0 ton/acre)	71.44/tonne	65.00/ton
GROSS MARGIN ANALYSIS (Based on average prices of $73.02/tonne and $66.25/ton)[b]		
Gross income	657	265
Total variable costs	254	103
Gross margin	403	162
CASH ANALYSIS		
Gross income	657	265
Cash costs[c]	307	124
Returns over cash costs	350	141

[a] Storage costs not included.

[b] Average hay price, 1983-87, from Ontario Agricultural Statistics, $56.48/tonne or $51.25/ton. Premium for 3% additional crude protein @ 55 cents/kg; $73.02/t; $66.25/ton.

[c] Cash costs include variable costs, plus interest on debt portion of investment in tractors and machines of $28/ha ($11/acre) plus other overhead costs.

Table 16.--Alfalfa Hay: Operation Costs, Ontario, 1988

Operation	Times over	Labour hours		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
				- dollars -	
Fertilizing	1	.20	.08	4.77	1.93
Cutting	2	1.63	.66	101.90	41.24
Raking	2	1.38	.56	44.92	18.18
Baling (1st cut)[a]	1	2.30	.93	55.50	22.46
Baling (2nd cut)[b]	1	1.73	.70	41.34	16.73
Hauling and unloading (1st cut)	1	2.30	.93	33.53	13.57
Hauling and unloading (2nd cut)	1	1.73	.70	25.08	10.15

[a] Yield 1st cut 5.2 t/ha; 2.3 ton/acre.
[b] Yield 2nd cut 3.8 t/ha; 1.7 ton/acre.

Table 17.-- Corn Silage: Estimated Cost of Production, Ontario, 1988

	Cost, Dollars	
	per hectare	per acre
VARIABLE COSTS		
Hired labour, .1 hours/ha	1	1
Seed, 59,000 kg/ha	59	24
Fertilizer, N - 127 kg/ha; P_2O_5 - 55 kg/ha; K_2O - 28 kg/ha	96	39
Herbicide	54	22
Insecticide	27	11
Tractor and machine costs:		
Repairs and maintenance	22	9
Fuel	25	10
Custom apply "N"	20	8
Custom harvesting and silo filling	119	48
Silo repair and maintenance	2	1
Interest on operating capital	25	10
TOTAL VARIABLE COSTS	450	183
FIXED COSTS		
Operator labour, 3.36 hours/ha	25	10
Management allowance, 5% of gross income	30	12
Tractor and machine costs:		
Depreciation	35	14
Interest on investment	17	7
Insurance and storage	7	3
Interest on land, $2,100/ha @ 5.1% per annum	107	43
Silo; interest, depreciation & insurance	61	25
Other overhead costs	37	15
TOTAL FIXED COSTS	319	129
TOTAL ALL COSTS	769	312
COST PER UNIT (Based on average yields of 28.25 tonne/ha and 12.60 ton/acre)[a]	27.22/tonne	24.76/ton
GROSS MARGIN ANALYSIS (Based on average prices of $20.98/tonne and $19.04/ton)[b]		
Gross income	593	240
Total variable costs	450	183
Gross margin	143	57
CASH ANALYSIS		
Gross income	593	240
Cash costs[c]	495	201
Returns over cash costs	98	39

[a] Yield is the five-year weighted average for 1983-87.
[b] Silage price per ton of $20.98/tonne ($19.04/ton) equals the grain corn price per bushel for same period times seven.
[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $8/ha ($3/acre) plus other overhead costs.

Table 18.--Corn Silage: Operation Costs, Ontario, 1988

Operation	Times over	Labour hours per ha.	Labour hours per ac.	Labour, tractor and machine costs per ha.	Labour, tractor and machine costs per ac.
				- dollars -	
Plowing	1	.79	.32	32.99	13.35
Discing	1	.30	.12	15.05	6.09
Spreading fertilizer	1	.49	.20	12.60	5.10
Cultivating, harrowing and packing	1	.30	.12	13.20	5.34
Hauling seed	1	.15	.06	4.50	1.82
Planting	1	.59	.24	28.34	11.47
Spraying herbicide	1	.30	.12	8.20	3.32
Row cultivating	1	.30	.12	7.78	3.15
Custom applying "N"	1	--	--	20.50	8.30
Custom harvesting and silo filling	1	--	--	119.23	48.25

-- Not applicable.

Appendix Table 1.--Average Farm Yields, Grain and Forage Crops, Ontario, 1982-1987, Imperial Units

Crop	1982	1983	1984	1985	1986	1987[a]	5-year 1983-87 Weighted Average
				- bushels per acre -			
Winter Wheat	43	50	57	67	54	52	55
Spring Wheat	40	36	43	51	41	42	42
Rye	35	34	37	40	35	37	36
Oats	61	46	60	67	61	61	59
Barley	59	46	59	67	60	61	59
Mixed Grains	64	49	65	70	63	65	62
Grain Corn	98	92	97	102	101	117	102
Soybeans	35	29	34	37	37	41	36
Flaxseed	22	13	25	25	23	27	21
Buckwheat	22	19	23	23	16	27	21
Canola	n/a	19	33	36	35	33	33
				- cwt. per acre -			
White Beans	13.6	12.5	13.3	14.3	8.5	18.2	13.3
				- tons per acre -			
Fodder (silage) corn	12.5	11.4	12.9	12.6	12.8	16.0	12.6
Hay	3.0	2.9	3.1	3.0	3.4	3.3	3.1

Appendix Table 2.--Farm Prices, Grain and Forage Crops, Ontario, 1981-1986 Imperial Units

Crop	1981	1982	1983	1984	1985	1986[a]	5-year 1982-86 Weighted Average
				- dollars per bushel -			
Winter Wheat	4.27	4.48	3.99	4.20	3.89	3.00	3.91
Spring Wheat	3.90	3.45	3.90	4.10	3.75	3.25	3.69
Rye	3.50	2.25	2.50	2.60	2.50	2.30	2.43
Oats	2.06	1.80	2.21	2.15	1.76	1.42	1.87
Barley	2.65	2.34	3.05	2.97	2.32	1.94	2.32
Mixed Grains	2.27	1.99	2.62	2.57	1.83	1.55	2.11
Grain Corn	2.92	2.84	4.03	3.41	2.87	2.24	3.08
Soybeans	7.19	6.80	9.33	7.55	6.71	6.25	7.33
Flaxseed	8.50	6.85	8.00	7.45	6.40	4.90	6.72
Buckwheat	3.30	2.90	3.00	4.00	4.00	3.60	3.50
Canola	n/a	n/a	8.85	7.80	5.90	4.70	n/a
				- dollars per cwt.-			
White Beans	30.70	24.44	28.41	23.60	17.60	36.06	24.02
				- dollars per ton -			
Fodder (silage) corn	18.10	17.40	21.40	21.70	22.20	18.10	20.16
Hay	45.70	47.10	50.40	50.10	51.80	53.70	50.62

n/a Not available.

[a] Prices and/or yields are subject to revision. 1987 prices not available.

Source: Agricultural Statistics for Ontario, Ontario Ministry of Agriculture and Food, Toronto.

Appendix Table 3.--Average Farm Yields, Grain and Forage Crops Ontario, 1982-1987, Metric Units

Crop	1982	1983	1984	1985	1986	1987[a]	5-year 1983-87 Weighted Average
			- kilograms per hectare -				
Winter Wheat ..	2,920	3,390	3,870	4,510	3,650	3,510	3,790
Spring Wheat ..	2,690	2,430	2,900	3,440	2,750	2,850	2,849
Rye	2,200	2,140	2,350	2,510	2,190	1,920	2,237
Oats	2,310	1,750	2,290	2,570	2,320	2,330	2,233
Barley	3,190	2,480	3,200	3,600	3,220	3,280	3,158
Mixed Grains ..	2,870	2,210	2,920	3,150	2,840	2,900	2,785
Grain Corn	6,170	5,810	6,070	6,400	6,350	7,330	6,370
Soybeans	2,330	2,020	2,260	2,500	2,500	2,760	2,424
Flaxseed	1,380	830	1,550	1,590	1,440	1,660	1,339
Buckwheat	1,180	1,020	1,250	1,250	860	1,440	1,152
Canola	n/a	1,050	1,850	2,010	1,960	1,820	1,870
White Beans ...	1,530	1,400	1,480	1,610	950	2,040	1,538
Fodder (silage)			- tonnes per hectare -				
corn	28.0	25.5	28.8	28.4	28.6	35.9	29.0
Hay	6.7	6.5	6.8	6.8	7.6	7.5	7.0

[a] Prices and/or yields are subject to revision, 1987 prices not available.
Source: Agricultural Statistics for Ontario, Ontario Ministry of Agriculture and Food.

Appendix Table 4.--Farm Prices, Grain and Forage Crops, Ontario, 1981-1986 (Metric Units)

Crop	1981	1982	1983	1984	1985	1986[a]	5-year 1982-86 Weighted Average
				- dollars per tonne -			
Winter Wheat ..	157.00	165.00	146.00	154.00	143.00	110.00	143.60
Spring Wheat ..	143.00	127.00	143.00	151.00	138.00	119.00	135.60
Rye	140.00	89.00	98.00	102.00	98.00	90.00	95.40
Oats	134.00	117.00	143.00	139.00	114.00	92.00	121.00
Barley	122.00	107.00	140.00	136.00	107.00	89.00	115.80
Mixed Grains ..	125.00	110.00	144.00	142.00	101.00	85.00	116.40
Grain Corn	115.00	112.00	159.00	134.00	113.00	88.00	121.20
Soybeans	264.00	250.00	343.00	278.00	246.00	230.00	269.40
Flaxseed	333.00	270.00	315.00	293.00	252.00	194.00	264.80
Buckwheat	152.00	133.00	138.00	184.00	184.00	165.00	160.80
Canola	n/a	n/a	n/a	344.00	260.00	207.00	n/a
White Beans ...	677.00	539.00	626.00	521.00	388.00	795.00	573.80
Fodder (silage) corn	20.00	19.20	23.60	23.90	24.40	20.00	22.22
Hay	50.30	51.90	55.60	55.20	57.10	59.20	55.80

n/a Not available.
[a] Prices and/or yields are subject to revision. 1987 prices not available.
Source: Agricultural Statistics for Ontario, Ontario Ministry of Agriculture and Food, Toronto.

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